Du'Bois J. Ferguson
Remediation Manager

Schlumberger Oilfield Service
300 Schlumberger Drive
Sugar Land, TX 77478
Tel: 281-285-3692
DFerguson3@slb.com

February 10, 2011

VIA FedEx Overnight

Section Chief
Environmental Enforcement Section
U.S. Department of Justice
PO Box 7611
Washington, DC 20044-7611

Craig Zeller
Remedial Project Manager
Superfund Division
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Re: DOJ Case No. 90-11-2-696/1

Subject: January 2011 Monthly Report
Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site
Natural Resources Trustees Consent Decree

Dear Section Chief:

In accordance with the Consent Decree and Section XIV of the Unilateral Administrative Order for the above referenced site, Schlumberger is required to submit Progress Reports on a quarterly basis. Given the current pace of activities, we will be submitting Progress Reports on a monthly basis until further notice in satisfaction of the reporting requirements of the Consent Decree and Unilateral Administrative Order.

In keeping with Paragraph 20 of the Consent Decree:

> I certify that the information contained in or accompanying this submission is true, accurate and complete. This certification is based on my personal preparation, review, or analysis of the submission, and/or supervision of persons who, acting on my instructions, made the verification that the submitted information is true, accurate and complete.

If you have any questions, please do not hesitate to contact me at (281) 285-3692.

Sincerely,

D. J. Ferguson

DuBois J. Ferguson
Remediation Manager

U.S. EPA REGION IV

SDMS

POOR LEGIBILITY

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V. 2-040506

cc: Honorable G. Ross Anderson, Jr.
G. Ross Anderson, Jr. Federal Building
and United States Courthouse
315 South McDuffie Street, 2nd Floor
Anderson, SC 29624

Honorable William W. Wilkins
Nexsen Pruet
55 E. Camperdown Way
Suite 400
Greenville SC 29601

Leon C. Harmon Esq.
Nexsen Pruet
55 E. Camperdown Way
Suite 400
Greenville SC 29601

John Cresswell
Assistant Director
Division of Site Assessment and Remediation
Bureau of Land &Waste Management
SC Department of Health and
Environmental Control
2600 Bull Street
Columbia, SC 29201

Regional Solicitor's Office
U.S. Department of the Interior
Attn: Harriet M. Deal
75 Spring Street, SW Room 304
Atlanta, GA 30303

Diane Beeman & Diane Duncan
Ecological Services Office
U.S. Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, SC 29407

Paul League
SC Department of Natural Resources
Office of Chief Counsel
1000 Assembly Street
Columbia, SC 29202

Anthony Rabern
Georgia Department of Natural Resources
3695 Highway 197
Clarkesville, GA 30523

Office of the Attorney General
Timothy J. Ritzka
Assistant Attorney General
40 Capitol Square SW
Atlanta, GA 30334

Jamie Sykes
Richard B. Russell Project Office
4144 Russell Dam Drive
Elberton, GA 30635

Frank S. Holleman III
Wyche Burgess Freeman & Parham, P.A.
44 East Camperdown Way
Greenville SC 29601-3591

Mr. Paul Doody
ARCADIS
6723 Towpath Road
Syracuse, NY 13214-0066

Mr. John N. Hanson
Beveridge & Diamond, P.C.
1350 I Street, N.W.
Suite 700
Washington, D.C. 20005-3311

January 2011 Monthly Report
Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site
Operable Unit 2

Activities Initiated/Completed

- Completed construction of siphons at WSI and operated the system to lower the water level behind the WSI dam in preparation for dam demolition
- Dredge Clare has progressed to STA 15+00, and continues to move back and forth along the creek to reach deeper sediment, to the extent practicable, accessible by the creek level being lowered.
- Dredge Kami is located at approximately Station 49+90 (Woodside II Impoundment).
- On January 18, 2011, SCDHEC Solid Waste Management Regional personnel were onsite for a general visit/inspection and performed a Class Three Landfill Inspection in accordance with Regulation 61-107.19, Part V. The inspection indicated that the facility was operating properly, and no problems were observed. The completed Inspection Form is provided as Attachment 1.
- Received a response dated January 19, 2011 from the Trustee Council on their proposed modification to the dredge verification protocols.
- Received an approval response from the Trustee Council dated January 25, 2011 to the Dredge Verification Report STA 5+00 to STA 10+00.

Results of Sampling, Tests, and Other Data

- Sampling and analysis is being conducted relative to the creek turbidity, and water treatment system (WTS) effluent water. Results for the effluent water are attached (Attachment 2) and the continuous turbidity monitoring data is available upon written request.
- Project photographs are included as Attachment 3.

Plans, Reports, and other Deliverables

- Analytical data related to samples collected from the WTS to assess water treatment effluent water were submitted to SCDHEC in the December Monthly Report (submitted January 28, 2011) in Attachment 2.

Work Planned for February 2011

- Continue dredge verification surveys with submittal of each 500 foot section to the Special Receivers and their consultant. Expecting STA 10+00 to STA 13+50 and STA 45+00 to 50+00.
- Continue placement of dredged sediment in SMU.

- Continue monitoring WTS discharge.
- Complete dredging in the WSI impoundment.
- Continue dredging in the WSII impoundment.
- Initiate demolition of WSI dam.

Issues Encountered, Anticipated Delays, Solutions

- Extreme weather conditions (e.g., subfreezing temperatures, large snow fall) during the week of January 10th continued to impact site operations, including temporary postponement of operations and frozen and/or broken components, despite Contractor's winterization efforts.
- Continuing to handle significant amount of debris and vegetation which presented material handling challenges and some delays to dredging near the Woodside I dam.
- The sluice gate used to release sediments from the Easley Central Dam remains partially open due to mechanical issues and debris blocking closure.

Class Three Landfill Inspection Form
Regulation 61-107.19, Part V

Facility Name: Bull Creek SWM Date/Time of Inspection 18 JAN 2016

County: Pickens Permit #: —

Reason for Inspection: X Routine; ____ Follow-up; ____ Complaint; ____ Other ____

Current Weather Conditions: Cloudy Skies 40°

Previous 24-hours: Rain (Y)N – If yes, amount < 1" inches; High winds Y(N)

1 – Meets or exceeds regulatory requirements; 2A – Improvement needed (minor issues exist; corrective measures recommended); 2B – Improvement needed (moderate issues exist; corrective action required and scheduled); 3 – Unacceptable (serious issues and/or recurring issues with minimal or no corrective action taken – alleged regulatory or permit condition violations have occurred – enforcement referral required); Y – Yes: Meets or exceeds regulatory requirements; N – No: Corrective measures recommended that should be fixed by the next inspection or an agreed upon completion date; NA – Not applicable; NI – Not Inspected

Procedures for Excluding Receipt of Unapproved Waste (258.20)
1. NA Overall effectiveness of Special Waste Analysis and Implementation Plan (SWAIP)
2. Y N NA NI Trained waste screener present
3. Y N NA NI Random daily load inspections conducted and documented
4. Y N NA NI Records of unacceptable waste maintained
5. Y N NA NI Personnel training program on recognition of regulated hazardous waste and PCB waste
6. Y N NA NI Record of Notification to Department within 72-hours of hazardous or PCB waste receipt
7. Y N NA NI Unauthorized wastes removed from working face by the end of the operating day

Cover Material Requirements (258.21)
8. ____ ≥ 6" soil (short-term cover)
9. N/A Alternate Daily Cover (ADC)
10. N/A ≥ 6" soil (long-term and/or intermediate cover)
11. Y N NA NI Adequate soil quantity available for cover

Control of (258.21, 22, 24, 25 and 37):
12. 1 Blowing litter
13. 1 Off-site odors
14. 1 Disease vectors
15. 1 Fires/Open burning
16. 1 Scavenging

Access Requirements (258.25)
17. 1 Condition of access controls
18. 1 Condition of all weather roads – entrance
19. 1 Condition of all weather – internal haul roads

Run-on/Run-off Controls (258.26)
20. 1 Condition of ditches/swales
21. 1 Condition of berms/terraces/downchutes
22. 1 Condition of sedimentation ponds

Leachate Seeps (258.26 and 27)
23. N/A Leachate seep management

Liquid Restrictions (258.28)
24. ____ Free of unauthorized bulk or non-containerized liquids

Record Keeping Requirements (258.29)
25. Y N NA NI Required records are maintained in the landfill's operating record

Scale Requirements (258.30)
26. Y N NA NI Scales installed and functioning properly

Required Equipment to Operate Landfill (258.31)
27. Y N NA NI Required equipment operational – if not please provide details in comments as to the type of equipment down for repairs, impact to operations, and status on temporary replacement equipment
- Dredges ✓
- Pumps ✓
- Screeners ✓
- Earth movers ✓

Certified Landfill Manager/Supervisor (258.32)
28. Y N NA NI Manager and supervisor certified by SCDHEC
29. Y N NA NI Certified manager or supervisor on-site

Leachate Collection System (258.33 and 34)
30. Y N NA NI Leachate handling agreement in place
31. ____ Leachate collection system management

Leachate Recirculation System (258 Subpart I and Permit)
32. ____ Leachate recirculation system management
33. Y N NA NI Required leachate recirculation reports/data contained in the landfill's operating record
34. N/A Leachate seep management
35. ____ Leachate collection system management

Testing of Municipal Solid Waste (MSW) Incinerator Ash (258.35)
36. Y N NA NI MSW incinerator ash management

Sign Requirements (258.36)
37. Y N NA NI Required signs posted

Conditions of Monitoring Wells (258.51)
38. 1 Monitoring well maintenance program

Working Face/Elevation (258.87)
39. Y N NA NI Method of elevation control with benchmark

Plans and Permit (Permit)
40. Y N NA NI Operating in accordance with approved plans and general permit
41. Y N NA NI Permitted engineering drawings available
42. Y N NA NI Permitted operational plan available
43. Y N NA NI Permitted stabilization/landscaping plan available
44. Y N NA NI Permitted contingency plan available
45. Y N NA NI Permitted approved groundwater-monitoring plan available
46. Y N NA NI Permitted closure plan available
47. Y N NA NI Permitted post-closure plan available

Name of those present during the Inspection: ____

Comments: NO PROBLEMS NOTED DURING INSPECTION

Inspection Item	Corrective action required	Date to be completed

Additional comment page: Y(N) Photos taken: Y(N)

The signature below certifies that the SCDHEC Inspector has personally checked each item and has answered according to the true condition existing at the time of inspection.

Facility Representative SCDHEC Inspector Bill Rogers

ARCADIS

Attachment 2

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017
www.arcadis-us.com

ENVIRONMENTAL

Mr. Dale Stoudemire, Manager
South Carolina Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data Management Section
2600 Bull Street
Columbia, South Carolina 29201

Subject:
Schlumberger Technology Corporation, Twelvemile Creek Restoration Project
Pickens County, South Carolina
December 2010 Sampling Results Report

Date:
January 28, 2011

Contact:
Lance S. Ketcham

Phone:
315.671.9163

Email:
lance.ketcham@
arcadis-us.com

Our ref:
MT001019

Dear Mr. Stoudemire:

On behalf of Schlumberger Technology Corporation (STC), ARCADIS is providing a summary of sampling results for the Twelvemile Creek Restoration Project in Pickens County for the month of December 2010 in accordance with the October 15, 2009 letter from Butch Swygert of South Carolina Department of Health and Environmental Control (SCDHEC) to Chris Moody of ARCADIS and the August 9, 2010 SCDHEC construction operation approval memorandum, which replaces the March 11, 2010 SCDHEC construction operation approval memorandum. The August 9, 2010 approval memorandum upgrades the onsite water treatment plant to a Group III – Physical/Chemical facility with a maximum discharge of 8.64 million gallons per day (MGD).

Table 1 contains the daily discharge information from the water treatment plant to Twelvemile Creek. This data is recorded onsite and is reviewed by a South Carolina certified water treatment plant operator. The maximum daily discharge for December 2010 was 3.33 MGD on December 29. The average discharge from the water treatment plant for the month of December was 1.51 MGD.

Table 2 contains the results of the analyses described in Table 1 of the October 15, 2009 letter that were performed on the water treatment plant effluent during the month of December 2010. The Laboratory Services Reports from Rogers & Callcott Laboratory Services related to these tests are provided in Attachment A. The samples were analyzed for pH, temperature, total suspended solids and PCBs. The results of these tests were within the ranges outlined in the October 15, 2009 letter.

Table 3 summarizes the results of the whole effluent toxicity (WET) testing; the Laboratory Services Reports for these tests are provided in Attachment B. Samples for toxicity testing were collected on December 7, 8 and 10, 2010. The acute toxicity testing passed for the month of December. Chronic testing for the dates mentioned indicated minimal effects on survival, however the results for reproduction were not within the ranges outlined in October 14, 2009 letter. Subsequent chronic testing was conducted on December 17, 20 and 22, 2010 and results were provided on January 3, 2011. The results from the subsequent testing again indicated minimal effect on survival and less impact on reproduction than the earlier test; however, the results were still just above the ranges outlined in the October 15, 2009 letter. The processes of the water treatment plant were modified to address the chronic WET testing results and subsequent re-sampling in the month of January shows results within the ranges outlined in the October 15, 2009 letter (results to be provided in next month's report).

If you have any questions on the above, please feel free to contact me.

Sincerely,

ARCADIS

Lance S. Ketcham
Principal Engineer

Copies:
Melinda Vickers, SCDHEC
Eric Kim, SCDHEC
Du'Bois J. Ferguson, STC
Gary Odom, STC
Paul Doody, ARCADIS

Table 1. Daily Discharge from Water Treatment Plant for December 2010. Twelvemile Creek Restoration Project, Pickens County

Date	Discharge, MGD
Monthly Avg [1]	MR
Daily Max [1]	MR
12/1/2010	1.77
12/2/2010	0.25
12/3/2010	1.65
12/4/2010	0.19
12/5/2010	0.00
12/6/2010	1.17
12/7/2010	0.84
12/8/2010	0.83
12/9/2010	2.16
12/10/2010	2.64
12/11/2010	2.20
12/12/2010	0.00
12/13/2010	2.53
12/14/2010	2.03
12/15/2010	1.37
12/16/2010	1.06
12/17/2010	1.68
12/18/2010	1.79
12/19/2010	0.00
12/20/2010	3.29
12/21/2010	2.58
12/22/2010	2.23
12/23/2010	2.73
12/24/2010	0.00
12/25/2010	0.00
12/26/2010	0.00
12/27/2010	1.33
12/28/2010	2.93
12/29/2010	**3.33**
12/30/2010	2.39
12/31/2010	1.85
Total	46.82
Days per Month	31
Average	1.51

Notes:

1. Data is from onsite records detailing the daily discharge volumes to Twelvemile Creek; a discharge of 0 MGD is recorded when the treatment plant is not operating or discharging to Twelvemile Creek. Discharge data was recorded by the South Carolina certified wastewater treatement plant operator from Rogers & Callcott.
2. The bolded value is the maximum daily discharge recorded.

Superscript Notes:

[1] Discharge reporting guidelines are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

Acronyms and Abbreviations:

Avg - average
Max - maximum
MGD - million gallons per day
MR - monitor and report

Table 2. Effluent Sampling Result for December 2010. Twelvemile Creek Restoration Project, Pickens County

Sample Number	Location	Sample Type	Week	Sample Date and Time	pH	Temp. (°C)	TSS (mg/L)	PCB (µg/L)						
								PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
Monthly Avg. [1]	--	--	--	--	6.0 to 8.5	--	25	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Daily Max. [1]	--	--	--	--	6.0 to 8.5	--	45	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AC92024	WTP Effluent Discharge	G	1	12/7/2010 09:20	6.6	7.1	NA	NA	NA	NA	NA	NA	NA	NA
AC92025	WTP Effluent Discharge	C		12/7/2010 09:15	NA	NA	7.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC92491	WTP Effluent Discharge	G	2	12/14/2010 16:00	6.5	7.3	NA	NA	NA	NA	NA	NA	NA	NA
AC92492	WTP Effluent Discharge	C		12/14/2010 15:55	NA	NA	8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC92931	WTP Effluent Discharge	G	3	12/21/2010 09:25	6.7	6.6	NA	NA	NA	NA	NA	NA	NA	NA
AC92932	WTP Effluent Discharge	C		12/21/2010 09:20	NA	NA	8.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC93170	WTP Effluent Discharge	G	4	12/29/2010 09:25	6.5	4.5	NA	NA	NA	NA	NA	NA	NA	NA
AC93171	WTP Effluent Discharge	C		12/29/2010 09:20	NA	NA	3.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
				Average	6.6	6.4	6.8	-	-	-	-	-	-	-

Notes:

1. Sampling results compiled from Laboratory Services Reports provided by Rogers & Callcot Laboratory Services and submitted in tabular form as required per the10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control [SCDHEC]) to Chris Moody (ARCADIS) and the 3/11/2010 SCDHEC construction and operational approval memorandum.
2. The monthly average includes non-detect readings (indicated by "<") and assumes a value equal to the detection limit. Monthly averages are not calculated for parameters without a detected concentration (indicated by "-").

Superscript Note:

[1] Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (SDHEC) to Chris Moody (ARCADIS)

Acronyms and Abbreviations:

°C - degrees centigrade
G - grab sample
C - 24-hour composite sample
µg/L - micrograms per liter
MGD - million gallons per day
mg/L - milligrams per liter
NA - not analyzed
PCB - polychlorinated biphenyl
Temp. - temperature

Table 3. Whole Effluent Toxicity Result for December 2010. Twelvemile Creek Restoration Project, Pickens County

WET Analysis	Monthly Avg.[1]	Daily Max.[1]	Event 1 Results	Event 2 Results
Ceriodaphnia dubia Chronic WET @ CTC=17.4%	25%	40%	75.1%	42.2%
Ceriodaphnia dubia Chronic WET-Reproduction @ CTC=17.4%	MR, %	MR, %	75.1%	42.2%
Ceriodaphnia dubia Chronic WET-Survival @ CTC=17.4%	MR, %	MR, %	0.0%	0.0%
Ceriodaphnia dubia Acute WET @ ATC=35.5%	–	0[2]	0	NA

Notes:

1. WET testing was performed by ETT.
2. Results of the WET testing are presented as the percent reduction relative to the control sample.
3. Samples for Event 1 were collected on 12/7, 12/8, and 12/10/2010. One composite sample was collected each day (sample numbers AC91981, AC92064, and AC92283, respectively) to complete the Chronic WET testing. Sample AC91881 was used in the Acute WET testing.
4. Samples for Event 2 were collected on 12/17, 12/20, and 12/22/2010. One composite sample was collected each day (sample numbers AC92779, AC92795, and AC92959, respectively) to complete the Chronic WET testing. Sample AC90996 was used in the Acute WET testing.
5. Shaded values indicate that the results are not within the ranges outlined in the 10/15/2009 letter.

Superscript Notes:

[1] Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

[2] A results of "0" indicates a passing result.

Acronyms and Abbreviations:

MR - monitor and report

NA - not analyzed

WET - whole effluent toxicity

ARCADIS

Attachment A

Laboratory Services Report:
October 15, 2009 Table 1
Analyses

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 12/07/2010
Time Received: 12:03
Date Reported: 12/09/2010

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC92024	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/07/2010 at 09:20
AC92025	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/07/2010 at 09:15

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC92024	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/07/2010 at 09:20

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.6	pH units		0.1	12/07/2010 09:20	LRW	SM 4500HB
Temperature (Field)	7.1	degrees C		0.1	12/07/2010 09:20	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC92025	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/07/2010 at 09:15

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				12/09/2010 00:00		
Total Suspended Solids	7.0	mg/l		2.0	12/07/2010 16:04	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	12/09/2010 00:06	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	93	%		0	12/09/2010 00:06	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	79	%		0	12/09/2010 00:06	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				12/07/2010 12:45	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name: SCHLUMBERGER

Address:

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr. 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS														
					TSS	PCB													
					N	N													Filtered (Yes/No)
					Y	Y													Cooled (Yes/No)
					P	G													Container Type (P/G)
					½G	2½L													Container Volume
					C	C													Sample Type (Grab/Composite)
					WW	WW													Sample Source (WW, GW, DW, Other)
					N	N													Sample Source Chlorinated (Yes/No)
					NA	Neg													Lab Receipt Cl$_2$ Check mtf 12-7-10
					NA	7													Lab Receipt pH Check
					A	A													Preserved (Code)
AC 92025	12/7	0915	WATER TREATMENT PLANT EFF. DISCH.	2	1	1													Sampler set-up @ 0945 on 12/6/10, Time grab. By R+C AC92004 pH 6.6 Grab taken + Temp 7.1 / Rec'd @ 0920 12/7/10 By R+C

A=None D=NaOH G=Boric Acid
B=HNO$_3$ E=HCL H=Ascorbic Acid
C=H$_2$SO$_4$ F=Na$_2$S$_2$O$_3$ I= ____

COMMENTS:

	Date/Time		Date/Time
SAMPLER Relinquished by (Sig.) ①	12/7/10 1203	Received by (Sig.) ② Shipper Name & #	12.7.10 1203
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #	
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #	

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection 0.6 °C NOT Blank
At time of lab receipt 2.4 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
® Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 12/14/2010
Time Received: 17:15
Date Reported: 12/16/2010

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC92491	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/14/2010 at 16:00
AC92492	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/14/2010 at 15:55

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** Csl
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC92491	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/14/2010 at 16:00

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.5	pH units		0.1	12/14/2010 16:00	LRW	SM 4500HB
Temperature (Field)	7.3	degrees C		0.1	12/14/2010 16:00	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC92492	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/14/2010 at 15:55

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				12/16/2010 00:00		
Total Suspended Solids	8.8	mg/l		2.0	12/15/2010 07:45	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	12/15/2010 19:01	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	87	%		0	12/15/2010 19:01	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	86	%		0	12/15/2010 19:01	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				12/15/2010 09:30	DBB	EPA 608

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5855, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: SCHLUMBERGER

Address:

Report To:

Telephone No.: FAX No.:

PO No.: Project No.:

Field	TSS	PCB
Filtered (Yes/No)	N	N
Cooled (Yes/No)	Y	Y
Container Type (P/G)	P	G
Container Volume		
Sample Type (Grab/Composite)	C	C
Sample Source (WW, GW, DW, Other)	WW	WW
Sample Source Chlorinated (Yes/No)	N	N
Lab Receipt Cl_2 Check	NA	Neg
Lab Receipt pH Check	NA	7
Preserved (Code)	A	A

Lab check initials: mcd 12-15-10

Preserved (Code): A–None, B–HNO_3, C–H_2SO_4, D–NaOH, E–HCL, F–$Na_2S_2O_3$, G–Boric Acid, H–Ascorbic Acid, I– ____

Rogers & Callcott Lab No.	Yr 10 Date	Time	Sample Description	Total Number of Containers	TSS	PCB	COMMENTS
AC 92492	1555 (→ 12/14 RW)	12/14	WATER TREATMENT PLANT EFF. DISCH	2	1	1-N	Sample was set out @ 1555 on 12/13/10 Time prop. By R+C. AC92491 pH 6.5 / Temp 7.3 } GRAB TAKEN + READ @ 1600 ON 12/14/10 By R+C.

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.) / Shipper Name & #	Date/Time
① [signature]	12/14/10 1715	② Norma Dalley	12/14/10 1715
③		④	
⑤		⑥	

Seal # at'chd by ○ Recvd. intact by ○ Seal # at'chd by ○ Recvd. intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection 1.6 °C
At time of lab receipt 1.2 °C

Form Revised July 2008 R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 12/21/2010
Time Received: 12:02
Date Reported: 12/23/2010

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC92931	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/21/2010 at 09:25
AC92932	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/21/2010 at 09:20

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC92931	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/21/2010 at 09:25

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.7	pH units		0.1	12/21/2010 09:25	LRW	SM 4500HB
Temperature (Field)	6.6	degrees C		0.1	12/21/2010 09:25	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC92932	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/21/2010 at 09:20

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				12/23/2010 00:00		
Total Suspended Solids	8.4	mg/l		2.0	12/21/2010 14:45	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	12/22/2010 21:38	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	96	%		0	12/22/2010 21:38	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	94	%		0	12/22/2010 21:38	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				12/21/2010 12:40	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name: SCHLUMBERGER

Address:

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr. 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: TSS	PCB
AC 92931	12/21	0920	WATER TREATMENT PLANT EFF. DISCH. *	3	2	1-N

Filtered (Yes/No)	N	N										
Cooled (Yes/No)	Y	Y										
Container Type (P/G)	P	G										
Container Volume	½L	4L										
Sample Type (Grab/Composite)	C	C										
Sample Source (WW, GW, DW, Other)	WW	WW										
Sample Source Chlorinated (Yes/No)	N	N										
Lab Receipt Cl_2 Check	NA	req										
Lab Receipt pH Check	NA	Kevlar										
Preserved (Code)	A	A										

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

SAMPLER SET-UP @ 0920 ON 12/20/10. TIME PROP. BY R+C

AC92931

PH 6.7 / GRAB TAKEN & READ
TEMP 6.6 / @ 0925 ON 12/21/10 BY R+C

SAMPLER Relinquished by (Sig.) ①	Date/Time 12/21/10 1202	Received by (Sig.) ② Shipper Name & #	Date/Time 12/21/10 1202
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* ENOUGH VOLUME FOR FIELD DUPLICATES

Temperature of blank or representative sample
At time of collection 2.4 °C
At time of lab receipt 1.5 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 12/29/2010
Time Received: 11:45
Date Reported: 01/03/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC93170	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/29/2010 at 09:25
AC93171	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/29/2010 at 09:20

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC93170	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/29/2010 at 09:25

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.5	pH units		0.1	12/29/2010 09:25	LRW	SM 4500HB
Temperature (Field)	4.5	degrees C		0.1	12/29/2010 09:25	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC93171	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/29/2010 at 09:20

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				01/03/2011 00:00		
Total Suspended Solids	3.0	mg/l		2.0	12/29/2010 12:35	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	12/30/2010 16:35	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	94	%		0	12/30/2010 16:35	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	94	%		0	12/30/2010 16:35	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				12/29/2010 13:15	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5855, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name SCHLUMBERGER

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS		
					TSS	PCB	
AC 93171	12/29	0920	WATER TREATMENT PLANT EFF. DISCH.	2	1	1 N	

Filtered (Yes/No)	N	N							
Cooled (Yes/No)	Y	Y							
Container Type (P/G)	A	G							
Container Volume	½G	2½L							
Sample Type (Grab/Composite)	C	C							
Sample Source (WW, GW, DW, Other)	NW	NW							
Sample Source Chlorinated (Yes/No)	N	N							
Lab Receipt Cl$_2$ Check	NA	Neg							
Lab Receipt pH Check 12-29-10 MCA	NA	7							
Preserved (Code)	A	A							

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

SAMPLER SET OUT @ 0920 ON 12/28/10, TIME PROP. BY R&C.

AC93170

PH 6.5 GRAB TAKEN

TEMP 4.5 READ @ 0925 ON 12/29/10 BY R&C

	Date/Time		Date/Time
SAMPLER Relinquished by (Sig.) ①	12/29/10 1145	Received by (Sig.) ② Shipper Name & #	12/29/10 1145
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #	
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #	
Seal # at'chd by ○ Recvd. Intact by ○		Seal # at'chd by ○ Recvd. Intact by ○	

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection 0.7 °C
At time of lab receipt 2.4 °C

ARCADIS

Attachment B

Laboratory Services Report:
Whole Effluent Toxicity Testing

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Reported: 12/16/2010

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC91981	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/07/2010 at 09:15
AC92064	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/08/2010 at 09:30
AC92283	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/10/2010 at 09:25

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Case Narrative

AC91981 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/07/2010 at 09:15

Composite sample AC 91981 was subcontracted to ETT for Acute and Chronic Toxicity tests.

AC92064 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/08/2010 at 09:30

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

AC92283 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/10/2010 at 09:25

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

Sample Number	Sample Description, Date and Time Collected
AC91981	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/07/2010 at 09:15

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				12/16/2010 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 10 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC92064	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/08/2010 at 09:30

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				12/16/2010 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 10 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC92283	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/10/2010 at 09:25

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				12/16/2010 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 10 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

ETT environmental, inc.
P.O. Box 16414, Greenville, SC 29606
(864) 877-8942 • Fax (864) 877-8038
4 Craftsman Court, Greer, SC 29650

Ceriodaphnia dubia Survival and Reproduction Test

EPA-821-R-02-013 Method 1002

Test Species: *Ceriodaphnia dubia*

Client: SCHLUMBERGER
Facility: EFFLUENT
NPDES #: SC

Test Date: 07-Dec-10

Laboratory ID#: T36594

Test Reviewed and Approved By:

Robert W. Kelley, Ph.D.
Laboratory Manager

[redacted] **Certification #E87819**

Test results presented in this report conform to all requirements of NELAC, conducted under NELAC Certification Number E87819 Florida Dept. of Health. Included results pertain only to provided samples.

SCDHEC Certification #23104

NCDENR Certification # 022

DMR Attachment for Chronic Multi-Concentration Whole Effluent Toxicity Test Results Using Linear Interpolation

TWELVE MILE CREEK RESTORATION F Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter Code TCP3B MLOC=1 CTC= 17.40% effluent

		Year	Month	Day		Year	Month	Day
Monitoring period	From	10	12	1	To	10	12	31

Date 07-Dec-10

Lab ID 23104

IC25= 9.37%

48 hr Chronic LC50 = > 100.0%

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance
0	10	0	24.9	6.99
8	10	0	20.8	17.07
17.4	10	0	6.2	16.62
35	10	1	3.1	5.66
50	10	1	1.6	4.04
100	10	10	0.0	0.00

% Survival Effect at CTC= 0.0%

% Reproduction Effect at CTC= 75.1%

Date

Lab ID 23104

IC25=

48 hr Chronic LC50 =

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance

% Survival Effect at CTC=

% Reproduction Effect at CTC=

Signature of Principal Executive Officer or Authorized Agent _____

Name/Title of Principal Executive Officer (*typed or printed*) _____

DHEC 3710 (8/05)

PERMITTEE NAME/ADDRESS (*Include Facility Name/Location If Different*)

NAME: TWELVE MILE CREEK RESTORATION PROJECT

ADDRESS:

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (*NPDES*)

DISCHARGE MONITORING REPORT (*DMR*)

Form Approved.

OMB No. 2040-0004

SC		MINOR	
PERMIT NUMBER	DISCHARGE NUMBER	DMR VALID:	FINAL LIMITS 04/01/2010-

FACILITY

LOCATION

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	10	12	01	TO	10	12	31

NOTE: Read Instructions before completing this form.

PARAMETER		QUANTITY OR LOADING			QUANTITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	Sample Type
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
TCP3B LAB ID: 23104 %Effect Statre 7Day Chr Ceriodaphnia MLOC=1	SAMPLE MEASUREMENT	********* *********	********* *********	***** *****	********* *********	75.1	75.1	PER-CENT	0	1/30	GR
	PERMIT REQUIREMENT			***** *****							GR
TJP3B LAB ID: 23104 %Mortality 7Day Chr CERIODAPHNIA MLOC=1	SAMPLE MEASUREMENT	********* *********	********* *********	***** *****	********* *********	0.0	0.0	PER-CENT	0	1/30	GR
	PERMIT REQUIREMENT			***** *****						1/30	GR
TVP3B LAB ID: 23104 % Repro Reduc Statre 7d Chr Ceriodaphnia MLOC=1	SAMPLE MEASUREMENT	********* *********	********* *********	***** *****	********* *********	75.1	75.1	PER-CENT	0	1/30	GR
	PERMIT REQUIREMENT			***** *****						1/30	GR
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
	personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		0	
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA CODE NUMBER	YEAR MO DAY

COMMENTS AND EXPLANATIONS OF ANY VIOLATIONS (*Reference all attachments here*)

Chronic toxicity CTC=100% effluent

CHRONIC DEFINITIVE SURVIVAL AND REPRODUCTION/GROWTH TEST
Statistical Analyses

Client: **TWELVE MILE CREEK RESTORATION PROJECT**

Sample Identification: **EFFLUENT**

Test Date: **07-Dec-2010**

Tests for Normality and Heterogeneity of Variance

Parameter	*Test Used*	*Result*
Normality	N/A	N/A
Variance	N/A	N/A

Sample Use

	Sample Date	Sample Used		
Sample A	07-Dec-10	07-Dec-10	08-Dec-10	
Sample B	09-Dec-10	09-Dec-10	10-Dec-10	
Sample C	11-Dec-10	11-Dec-10	12-Dec-10	13-Dec-10

Tests for Differences in Survival and Reproduction

Test Type Used: **Linear Interpolation**

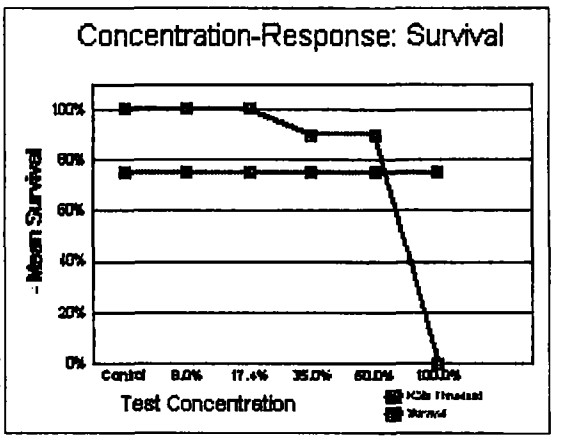
		% Effluent					
Effect	**Control**	8.0%	17.4%	35.0%	50.0%	100.0%	
Survival	100.0%	100.0%	100.0%	90.0%	90.0%	0.0%	
% reduction		0.0%	0.0%	10.0%	10.0%	100.0%	
Reproduction	24.9	20.8	6.2	3.1	1.6	0.0	
% reduction (smoothed)		16.5%	75.1%	87.6%	93.6%	100.0%	
Variance	6.99	17.07	16.62	5.66	4.04	0.00	

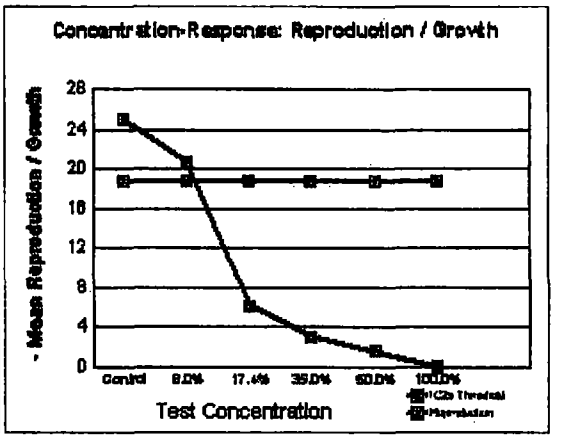
Acceptability Criteria	Value	Upper Limit	Lower Limit
CV:Coeff. of Variation	10.6%	42.0%	8.9%
PMSD: % MSD	11.1%	37.0%	11.0%
MSD:Min. Sign. Diff.	2.8	Acceptability criteria limits not exceeded	

IC25 Point Estimates		
Survival	IC25=	58.3%
Reproduction	IC25=	9.4%

Hypothesis Testing	
NOEC (Reprodu	8.0%
ChV (Reproduct	11.8%

TEST RESULTS	
%Reduction per Linear Interpolation	
@CTC of	17.4%
Survival effect	0.0%
Reproduction effect	75.1%
	FAIL





Comments

source	rep	Test Day 1	2	3	4	5	6	7	8	Total	
N7,11/25	A			4	7	11				22	control
N6,11/25	B			4	8	12				24	
Q1,11/25	C			4	10	13				27	
W6,11/26	D			5	7	10				22	
X1,11/26	E			5	8	11				24	
X2,11/26	F			5	8	0	17			30	
C3,11/25	G			0	4	10	11			25	
F3,11/25	H			0	3	10	11			24	
F2,11/25	I			0	5	8	10			23	
DD4,11/26	J			0	5	10	13			28	24.9
	A			3	8	11				22	
	B			3	7	0	11			21	
	C			4	8	0	11			23	
	D			5	7	0	14			26	
8	E			4	8	0	14			26	
	F			0	5	0	13			18	
	G			0	4	10	0			14	
	H			0	2	6	9			17	
	I			0	3	6	8			17	Mean
	J			0	4	9	11			24	20.8
	A			0	0	0	3			3	
	B			0	0	1	8			9	
	C			0	0	0	5			5	
	D			2	0	4	6			12	
17.4	E			0	0	3	9			12	
	F			0	0	0	9			9	
	G			0	0	0	0			0	
	H			0	3	0	0			3	
	I			0	0	4	0			4	Mean
	J			0	0	5	0			5	6.2
	A			0	0	0	7			7	
	B			0	0	0	4			4	
	C			0	0	0	2			2	
	D			0	0	0	3			3	
35	E			0	0	0	6			6	
	F			0	0	0	5			5	
	G			0	0	0	0			0	
	H			0	0	0	2			2	
	I			0	0	0	2			2	Mean
	J			0	0	D				0	3.1
	A			0	0	0	0			0	
	B			0	0	3	0			3	
	C			0	0	0	3			3	
	D			0	0	0	2			2	
50	E			0	0	2	0			2	
	F			0	0	2	4			6	
	G			0	0	0	0			0	
	H			0	0	0	0			0	
	I			D						0	Mean
	J			0	0	0	0			0	1.6
	A	D								0	
	B	D								0	
	C	D								0	
	D		D							0	
100	E	D								0	
	F		D							0	
	G	D								0	
	H	D								0	
	I		D							0	Mean
	J	D								0	0.0
renew		BB	BB	JC	JS	AE			End Date		
fed		BB	BB	JC	JS	AE			13-Dec-10		
time fed & renew		01:20 PM	01:43 PM	01:19 PM	12:37 PM	10:35 AM			02:50 PM	JC	
New temp. °C		24.6	25.1	24.8	25.4	25.2					
Old temp. °C		24.9	24.9	24.4	25.6	25.6	25.3				

D=Dead N/A-Lost or not used

Lab#	T36594
Client	SCHLUMBERGER
Sample ID	EFFLUENT
NPDES#	SC
County	0
Month	12
Start & fed Date	40519
Start & fed Time	1445
Started & fed By	BB
Test Organism	Ceriodaphnia dubia
Neo. born date	40518
Neo. born time	BATCH 2
Test Type	SCCD
Dilution Water	MHSF
Units for Conc.	%
%3rd BROOD	
Test vessels	30 ml
Test volume	15 ml
Incubator #	1
Light	16l/8dk
Initial Temp °C	25
Selenastrum	0.05 ml
YAT	0.05 ml
Test method	EPA 821-R-02-013:1002

Comments

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1656 Fax (864) 232-6140
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Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 of 1

Client Name: ROGERS & CALLCOTT

Address:

Report To:

Telephone No.: FAX No.:

PO No.: Project No.:

Rogers & Callcott Lab No.	Date (Yr 10)	Time	Sample Description	Total Number of Containers	PARAMETERS: Acute Ceriodaphnia Toxicity (A)
AC 91981	12/7	0915	WASTE TREATMENT PLANT * EFF. DISCH.	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½ L
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl_2 Check	
Lab Receipt pH Check	
Preserved (Code)	A

A—None B—HNO_3 C—H_2SO_4 D—NaOH E—HCL F—$Na_2S_2O_3$ G—Boric Acid H—Ascorbic Acid I—____

COMMENTS:

3654A/3655

SAMPLED SET-UP @ 0915 ON 12/7/10 TIME PROP. BY R&C

	Date/Time		Date/Time	
SAMPLER Relinquished by (Sig.) ①	12/7/10 1355	Received by (Sig.) ② Shipper Name & #	12/7/10 1355	**KNOWN HAZARDS ASSOCIATED WITH SAMPLES** * DELIVER TO ETT LAB
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time	
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time	Temperature of blank or representative sample: At time of collection 0.6 °C; At time of lab receipt 1.4 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 1

Client Name ROGERS & CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr. 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY
AC 92064	12/8	0930	WATER TREATMENT PLANT * EFF. DISCHARGE	1	1

N										Filtered (Yes/No)
Y										Cooled (Yes/No)
P										Container Type (P/G)
½G										Container Volume
C										Sample Type (Grab/Composite)
WW										Sample Source (WW, GW, DW, Other)
N										Sample Source Chlorinated (Yes/No)
										Lab Receipt Cl_2 Check
										Lab Receipt pH Check
A										Preserved (Code)

A–None D–NaOH G–Boric Acid
B–HNO_3 E–HCL H–Ascorbic Acid
C–H_2SO_4 F–$Na_2S_2O_3$ I– ____

COMMENTS:

36548

Samples set to @ 0930 on 12/7/10 Time Disp. By R+C

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
①	12/8/10 1330	② Shipper Name & #	12/8/10 1330
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETI LAB

Temperature of blank or representative sample

At time of collection −1.0 °C NOT FROZEN

At time of lab receipt 3.1 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

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CHAIN OF CUSTODY RECORD

PAGE 1 / 1

Client Name: ROGERS + CALLCOTT

Address:

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY
AC 92283	12/10	0925 ~~0930~~ plus 5 minutes	WATER TREATMENT PLANT * EFF. DISCH.	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	1/2G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl, Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

36594C
SAMPLE SCHED-TO @ 0925
ON 12/9/10 TIME PROP.
BY R&C

SAMPLER Relinquished by (Sig.) ①	Date/Time 12/10/10 1335	Received by (Sig.) ② Shipper Name & #	Date/Time 12/10/10 1335
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal # at'chd by ○ Recvd. Intact by ○		Seal # at'chd by ○ Recvd. Intact by ○	

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample
At time of collection 1.3 °C
At time of lab receipt 2.6 °C

Form Revised July 2008

R/C COC FORM

D H E C

PROMOTE PROTECT PROSPER
South Carolina Department of Health
and Environmental Control

DMR Attachment for Pass/Fail Whole Effluent Toxicity Test Results

TWELVE MILE CREEK RESTORATION PROJE Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter Code TCP3E MLOC=1 CTC= 17.40% effluer

	Year	Month	Day		Year	Month	Day
Monitoring period From	10	12	01	To	10	12	31

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date 07-Dec-10
Lab ID 23104

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control	20	0				
Test	20	0	Pass			

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Signature of Principal Executive Officer or Authorized Agent

Name/Title of Principal Executive Officer (*typed or printed*)

DHEC 3420 (8/05)

Control Survival and Reproduction by Test Day

source	rep	1	2	3	4	5	6	7	8	Total	
W7 11-26	A		0							0	
U1 11-26	A		0							0	
X5 11-26	A		0							0	
W3 11-26	A		0							0	
FF7 11-26	A		0							0	
T6 11-26	B		0							0	
Random	B		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	D		0							0	
	D		0							0	
	D		0							0	
	D		0							0	Mean
	D		0							0	0.0

35.5 % Effluent Survival and Reproduction by Test Day

		1	2	3	4	5	6	7	8	Total	
W7 11-2	A		0							0	
U1 11-2	A		0							0	
X5 11-2	A		0							0	
W3 11-2	A		0							0	
FF7 11-	A		0							0	
T6 11-2	B		0							0	
Random	B		0							0	
0	B		0							0	
0	B		0							0	
0	B		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	D		0							0	
0	D		0							0	
0	D		0							0	
0	D		0							0	Mean
0	D		0							0	0.0

										10-Dec-10	
										03:33 PM	JC
Old temp. °C			25.1								

D=Dead N/A-Lost or not used

****

09:15 AM

[illegible]	T36595
[illegible]	SCHLUMBERGER
[illegible]	EFFLUENT
[illegible]	SC
[illegible]	0
[illegible]	12
[illegible]	08-Dec-10
[illegible]	1615
[illegible]	JC
[illegible]	Ceriodaphnia dubia
[illegible]	12-7-10
[illegible]	BATCH 2
[illegible]	SCAPF
[illegible]	MHSF
[illegible]	%
[illegible]	35.5
[illegible]	
[illegible]	30 ml
[illegible]	15 ml
[illegible]	1
[illegible]	16lt/8dk
[illegible]	24.8
[illegible]	0.05 ml
[illegible]	0.05 ml
[illegible]	EPA 821-R-02-013:1002

Comments

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Acute Ceriodaphnia Toxicity
AC 91981	12/7	0915	WATER TREATMENT PLANT * EFF. DISCH.	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½ L
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl, Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

SAMPLER SET-UP @ 0915 ON 12/7/10 TIME PROP. BY R+C

SAMPLER Relinquished by (Sig.) ①	Date/Time 12/7/10 1355	Received by (Sig.) ② Shipper Name & #	Date/Time 12/7/10 1355
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal #	at'chd by ○ Recvd. Intact by ○	Seal #	at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVER TO ETT LAB

Temperature of blank or representative sample

At time of collection 0.6 °C

At time of lab receipt 1.4 °C

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name ROGERS & CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr. 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY
AC 92064	12/8	0930	WATER TREATMENT PLANT *	1	1
			ETF DISCHARGE		

	N
	Y
	P
	½G
	C
	WW
	N
	↑
	↓
	A

Filtered (Yes/No)
Cooled (Yes/No)
Container Type (P/G)
Container Volume
Sample Type (Grab/Composite)
Sample Source (WW, GW, DW, Other)
Sample Source Chlorinated (Yes/No)
Lab Receipt Cl$_2$ Check
Lab Receipt pH Check
Preserved (Code)

A–None D–NaOH G–Boric Acid
B–HNO_3 E–HCL H–Ascorbic Acid
C–H_2SO_4 F–$Na_2S_2O_3$ I– ____

COMMENTS:

SAMPLER RELINQUISHED BY (SIG.) ① [signature]

SAMPLER RELINQUISHED BY (SIG.) ① [signature] Date/Time 12/8/10 1330

Received by (Sig.) ② [signature] Shipper Name & # Date/Time 12/8/10 1330

Relinquished by (Sig.) ③ Date/Time

Received by (Sig.) ④ Shipper Name & # Date/Time

Relinquished by (Sig.) ⑤ Date/Time

Received by (Sig.) ⑥ Shipper Name & # Date/Time

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETF LAB

Temperature of blank or representative sample

At time of collection −1.0 °C

At time of lab receipt 3.1 °C

SAMPLER GIVEN SET-T @ 0930 ON 12/7/10 TIME PROP. BY R+C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name ROGERS + CALLCOTT

Address _____

_____

Report To: _____

Telephone No. _____ FAX No. _____

PO No. _____ Project No. _____

Rogers & Callcott Lab No.	Yr 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY
AC 92283	12/10	0925 0930	WATER TREATMENT PLANT *	1	1
			EFF. DISCH.		

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	4G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl$_2$ Check	
Lab Receipt pH Check	
Preserved (Code)	A

A–None B–HNO_3 C–H_2SO_4 D–NaOH E–HCL F–$Na_2S_2O_3$ G–Boric Acid H–Ascorbic Acid I– ____

COMMENTS:

SAMPLED SET-UP @ 0925 ON 12/9/10 TIME PROP. BY R&C

SAMPLER Relinquished by (Sig.) ①	Date/Time 12/10/10 1335	Received by (Sig.) ② Shipper Name & #	Date/Time 12/10/10 1335
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample

At time of collection 1.3 °C

At time of lab receipt 2.6 °C

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
® Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Reported: 01/03/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC92779	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/17/2010 at 10:10
AC92795	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/20/2010 at 09:45
AC92959	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/22/2010 at 09:30

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham P Dougher A Kohler S Cary

Case Narrative

AC92779 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/17/2010 at 10:10

Grab sample AC 92779 was subcontracted to ETT for Chronic Toxicity testing.

AC92795 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/20/2010 at 09:45

This sample was an additional grab subcontracted to complete the Chronic Toxicity testing.

AC92959 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/22/2010 at 09:30

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

Sample Number	Sample Description, Date and Time Collected
AC92779	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/17/2010 at 10:10

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				01/03/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 7 pages for Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC92795	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 12/20/2010 at 09:45

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				01/03/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 7 pages for Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC92959	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 12/22/2010 at 09:30

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				01/03/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 7 pages for Chronic Toxicity from ETT Environmental Inc.

ETT Environmental, Inc.
P.O. Box 16414, Greenville, SC 29606
(864) 877-8942 • Fax (864) 877-8938
4 Craftsman Court, Greer, SC 29650

Ceriodaphnia dubia Survival and Reproduction Test

EPA-821-R-02-013 Method 1002

Test Species: *Ceriodaphnia dubia*

Client: SCHLUMBERGER
Facility: EFFLUENT
NPDES #: SC

Test Date: 17-Dec-10

Laboratory ID#: T36655

Test Reviewed and Approved By:

Robert W. Kelley, Ph.D.
Laboratory Manager

[redacted] **Certification #E87819**

Test results presented in this report conform to all requirements of NELAC, conducted under NELAC Certification Number E87819 Florida Dept. of Health. Included results pertain only to provided samples.

SCDHEC Certification #23104

NCDENR Certification # 022

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

DMR Attachment for Chronic Multi-Concentration Whole Effluent Toxicity Test Results Using Linear Interpolation

TWELVE MILE CREEK RESTORATION P Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter Code TCP3B MLOC=1 CTC= 17.40% effluent

Monitoring period		Year	Month	Day		Year	Month	Day
	From	10	12	1	To	10	12	31

Date 17-Dec-10

Lab ID 23104

IC25= < 8.0%

48 hr Chronic LC50 = > 100.0%

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance
0	10	0	25.1	3.43
8	10	0	18.6	13.60
17.4	10	0	14.5	31.39
35	10	0	4.9	20.10
50	10	0	3.1	8.32
100	10	10	0.0	0.00

% Survival Effect at CTC= 0.0%

% Reproduction Effect at CTC= 42.2%

Date

Lab ID 23104

IC25=

48 hr Chronic LC50 =

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance

% Survival Effect at CTC=

% Reproduction Effect at CTC=

Signature of Principal Executive Officer or Authorized Agent _____

Name/Title of Principal Executive Officer (*typed or printed*) _____

DHEC 3710 (8/05)

CHRONIC DEFINITIVE SURVIVAL AND REPRODUCTION/GROWTH TEST
Statistical Analyses

Client: **TWELVE MILE CREEK RESTORATION PROJECT**

Sample Identification: **EFFLUENT**

Test Date: **17-Dec-2010**

Tests for Normality and Heterogeneity of Variance

Parameter	*Test Used*	*Result*
Normality	N/A	N/A
Variance	N/A	N/A

Sample Use

	Sample Date	Sample Used		
Sample A	17-Dec-10	17-Dec-10	18-Dec-10	
Sample B	19-Dec-10	19-Dec-10	20-Dec-10	
Sample C	21-Dec-10	21-Dec-10	22-Dec-10	23-Dec-10

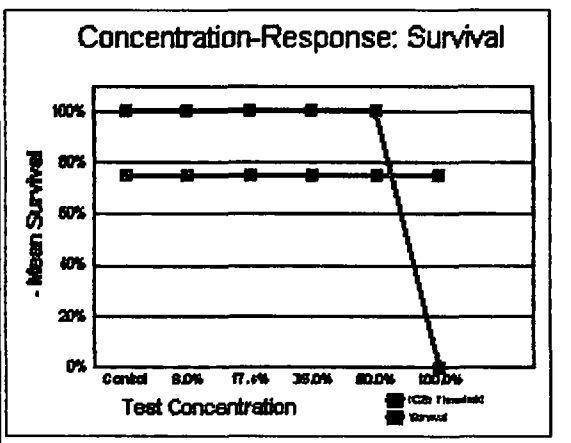
Tests for Differences in Survival and Reproduction

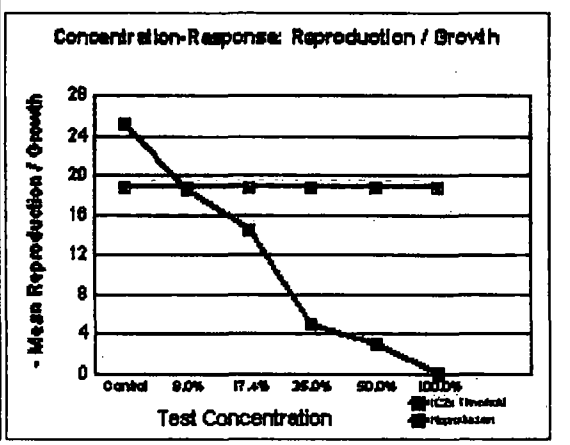
Test Type Used: **Linear Interpolation**

Effect	Control	% Effluent 8.0%	17.4%	35.0%	50.0%	100.0%
Survival	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
% reduction		0.0%	0.0%	0.0%	0.0%	100.0%
Reproduction	25.1	18.6	14.5	4.9	3.1	0.0
% reduction (smoothed)		25.9%	42.2%	80.5%	87.6%	100.0%
Variance	3.43	13.60	31.39	20.10	8.32	0.00

Acceptability Criteria	Value	Upper Limit	Lower Limit
CV:Coeff. of Variation	7.4%	42.0%	8.9%
PMSD: % MSD	13.6%	37.0%	11.0%
MSD:Min. Sign. Diff.	3.4	Acceptability criteria limits not exceeded	

IC25 Point Estimates		TEST RESULTS	
Survival	IC25= 62.5%	%Reduction per Linear Interpolation	
Reproduction	IC25= < 8.0%	@CTC of	17.4%
Hypothesis Testing		Survival effect	0.0%
NOEC Reproduc	<8.0%	Reproduction effect	42.2%
ChV Reproducti	<8.0%		FAIL





Comments

Source	Rep	Test Day 1	2	3	4	5	6	7	8	Total	
C9 12-9	A			3	0	9	11			23	control
EE3 12-10	B			4	0	11	10			25	
AA10 12-1	C			3	0	12	9			24	
EE8 12-10	D			4	0	11	14			29	
X5 12-10	E			0	5	8	11			24	
M8 12-9	F			3	0	10	12			25	
X10 12-10	G			0	5	9	13			27	
O4 12-9	H			4	9	0	12			25	
M3 12-9	I			3	9	0	11			23	
BB6 12-10	J			4	0	11	11			26	25.1
8	A			3	0	7	8			18	
	B			3	0	0	11			14	
	C			3	0	8	12			23	
	D			4	0	6	11			21	
	E			0	5	9	2			16	
	F			3	0	9	6			18	
	G			3	0	7	12			22	
	H			3	8	0	9			20	
	I			4	9	0	9			22	Mean
	J			0	3	9	0			12	18.6
17.4	A			3	0	0	11			14	
	B			3	0	8	7			18	
	C			3	0	6	11			20	
	D			0	2	9	0			11	
	E			0	5	0	0			5	
	F			0	0	8	8			16	
	G			3	4	0	0			7	
	H			0	0	5	8			13	
	I			4	0	6	9			19	Mean
	J			4	0	9	9			22	14.5
35	A			3	0	0	0			3	
	B			0	0	2	0			2	
	C			0	0	0	7			7	
	D			0	0	0	0			0	
	E			0	2	0	0			2	
	F			4	0	0	7			11	
	G			0	0	0	0			0	
	H			3	0	0	6			9	
	I			3	0	0	0			3	Mean
	J			4	0	0	8			12	4.9
50	A			4	0	0	0			4	
	B			0	0	0	0			0	
	C			0	0	0	4			4	
	D			0	0	0	0			0	
	E			0	0	0	0			0	
	F			0	0	0	5			5	
	G			0	0	0	4			4	
	H			2	0	0	5			7	
	I			0	0	0	0			0	Mean
	J			3	0	0	4			7	3.1
100	A		D							0	
	B		D							0	
	C		D							0	
	D		D							0	
	E		D							0	
	F			D						0	
	G		D							0	
	H		D							0	
	I		D							0	Mean
	J		D							0	0.0
renew		JC	BB	AE	JS	BB			End Date		
fed		JC	BB	AE	JS	BB			23-Dec-10		
time fed & renew		10:08 AM	09:02 AM	04:02 PM	12:07 PM	03:14 PM			02:28 PM	JS	
New temp. °C		24.8	25.1	24.9	24.3	24.9					
Old temp. °C		24.8	24.9	25.2	24.4	25.1			25.6		

D=Dead N/A-Lost or not used

Lab#	T38655
Client	SCHLUMBERGER
Sample ID	EFFLUENT
NPDES#	SC
County	0
Month	12
Start & fed Date	17-Dec-10
Start & fed Time	1400
Started & fed By	AE
Test Organism	Ceriodaphnia dubia
Neo. born date	16-Dec-10
Neo. born time	BATCH 2
Test Type	SCCD
Dilution Water	MHSF
Units for Conc.	%
%3rd BROOD	
Test vessels	30 ml
Test volume	15 ml
Incubator #	1
Light	16l/8dk
Initial Temp °C	5 12-10
Selenastrum	0.05 ml
YAT	0.05 ml
Test method	EPA 821-R-02-013:1002

Comments

Brian Collett

TOXICITY CHAIN OF CUSTODY

ETT environmental, inc.

Mailing Address: PO Box 16414, Greenville, SC 29606-7414
Shipping Address: 4 Craftsman Ct, Greer, SC 29650
Phone: (864) 877-6942 or (800) 891-2325
FAX: (864) 877-6938
email: mail@ettenvironmental.com

Page ____ of ____

Facility: 12 Mile Creek

State: SC

NPDES #:

ETT ASSIGNED LAB ID #	SAMPLE ID	Environmental Program: Clean Water Act	Stormwater	Sediment	Non-Regulatory	Test Container: Indicate # of Containers: 1/2 gallon plastic	1 gallon plastic	1 gallon cubitainer	1 liter glass	5 gallon bucket	Other*	Preserv-ative: water ice	Other*	Sample Type: Composite - Flow Prop.	Composite - Time Prop.	Grab	Test parameter Whole Effluent Toxicity: Pass/Fail	Delta. (Multi-Conc.)	Acute: C. dubia: EPA 2002	D. ambigua: EPA 2002	Fathead 48hr: EPA 2000	Fathead 96hr: EPA 2000	Myrid: EPA 2007	Chronic: C. dubia: EPA 1002	D. ambigua: EPA 1002	Fathead: EPA 1000	Myrid: EPA 1007	Special: TIE/TRE	WER	Sediment: 10 Day Hyalella	10 Day Chironomus	Other*	Test parameter Associated Chemistry: Alkalinity	Hardness	Conductivity	Residual Chlorine	Salinity	Ammonia-N	Macroinvertebrate ID
366JJA	Effluent	✓				1						✓				✓		✓						✓										✓	✓	✓	✓			

COMPOSITE SAMPLING PROCEDURES
Composite samples must be collected over a 24 hour period.
Time Proportional: 1 sample each hour for 24 hours. Equal volumes.
or at minimum 1 sample every 4 hours over 24 hours.
Flow Proportional: As per instructions in NPDES permit.

TEMPERATURE MONITORING PROCEDURES
Sample temperature during collection and transport must be between 0.0 and 6.0 °C. Samples must not be frozen. Use water ice in sealed bags.
Measure temperature upon receipt and record.
Notify client to resample if temperature is out of range.

HOLD TIME PROCEDURES
For toxicity testing the sample must first be used within 36 hours of sample collection (completion of composite sample).
Sample may not be used after 72 hours from sample collection.

* Special Instructions:

Sample Custody Transfer Record

Date	Time	Relinquished By / Organization:	Received By / Organization	Secure Area	Receipt Temp °C
12/17/10	1555	B. Kent James	[signature]	✓	1.4

Sampling

Composite	Grab
Start Date/Time:	Date/Time: 12/17/10 1010
Set By:	Collected By: B. Kent James
End Date/Time:	
Ended By:	Temp. at Collection:

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 of 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Yr 10 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY	Preserved (Code)	COMMENTS
AC92795	12/20	0945	WASTE TREATMENT PLANT * EFF. DISCH.	1	1	A	366JJB GRAB TAKEN @ 0945 ON 12/20/10 BY R+C

Filtered (Yes/No): N
Cooled (Yes/No): Y
Container Type (P/G): P
Container Volume: 2G
Sample Type (Grab/Composite): G
Sample Source (WW, GW, DW, Other): WW
Sample Source Chlorinated (Yes/No): N
Lab Receipt Cl, Check
Lab Receipt pH Check

A–None D–NaOH G–Boric Acid
B–HNO_3 E–HCL H–Ascorbic Acid
C–H_2SO_4 F–$Na_2S_2O_3$ I– ____

SAMPLER Relinquished by (Sig.) ①	Date/Time	Received by (Sig.) ② Shipper Name & #	Date/Time
	12/20/10 1420		12/20/10 1420
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt 3.5 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No.

Rogers & Callcott Lab No.	Date (Yr 10)	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY	Preserved (Code)	Filtered (Yes/No)	Cooled (Yes/No)	Container Type (P/G)	Container Volume	Sample Type (Grab/Composite)	Sample Source (WW, GW, DW, Other)	Sample Source Chlorinated (Yes/No)	Lab Receipt Cl_2 Check	Lab Receipt pH Check	COMMENTS
						A	N	Y	P	VG	C	WN	N			36.55C
AC 92959	12/22	0930	WATER TREATMENT PLANT * EFF. DISCH.	1	1											SAMPLED SET-UP @ 0930 ON 12/21/10 TIME PROP. BY R+C

A=None B=HNO_3 C=H_2SO_4 D=NaOH E=HCL F=$Na_2S_2O_3$ G=Boric Acid H=Ascorbic Acid I= ____

	Date/Time		Date/Time	
SAMPLER Relinquished by (Sig.) ①	12/22/10 1322	Received by (Sig.) ② Shipper Name & #	12/22/10 1322	KNOWN HAZARDS ASSOCIATED WITH SAMPLES * DELIVERED TO ETT LAB
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #		
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #		Temperature of blank or representative sample: At time of collection 3.2 °C; At time of lab receipt 2.2 °C

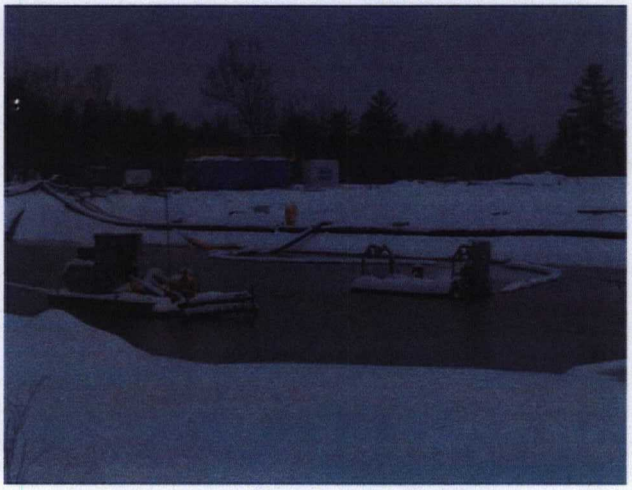
Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

ARCADIS
Infrastructure · Water · Environment · Buildings

Twelvemile Creek Restoration Project
STC · Cateechee, SC

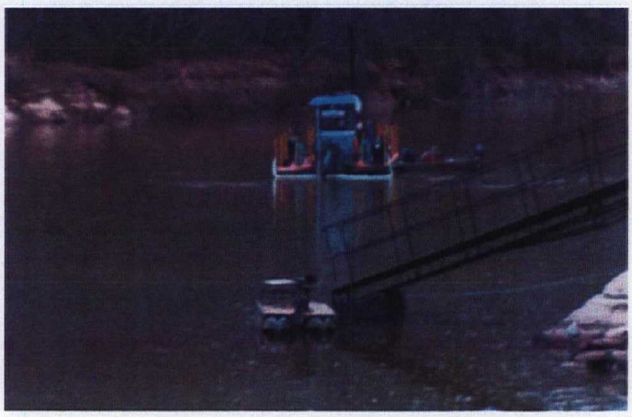
January Monthly Construction Photo Log

Snow and ice shut down operations at the Site.

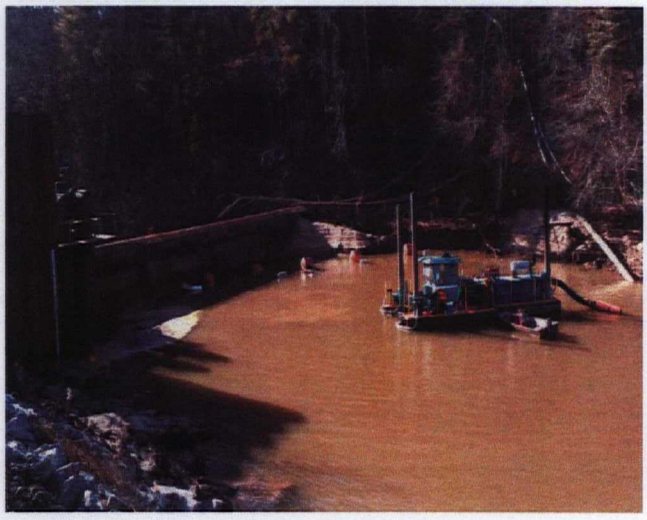


Snow and ice cover the SMU pond.

Clare Dredge dredging hole at WS1 for Siphon installation.



Floating bridge installed to access dredge from a lower water level.



Dredge Clare operating at target water elevation of 750.0'.

Downstream view of the WSI dam without water flowing over the top (due to siphon operation).